

Serial No. 10/786,307
Reply to Office Action of November 3, 2005

Docket No. IK-0072

Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 9 and replaces the original sheet. In Fig. 9, previously omitted element 338 has been added.

Attachment: Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

Claims 1, 3, 5-12 and 14-24 are pending in this application. By this Amendment, claims 1, 3, 5, 8, 10, 14-18 and 21 are amended, claims 2, 4 and 13 are canceled without prejudice or disclaimer and claims 22-24 are newly added. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

A. The Office Action objects to the drawings. Applicants respectfully submit the above amendments obviate the grounds for the objection. Further, with respect to a dissipating unit, Applicants respectfully submit that such a dissipating unit can be illustrated as an opening in dissipating fan 110, shown by exemplary dissipating unit 338 or at an output of fan 16 or the like. With respect to a frame as shown in Fig. 9, Applicants respectfully submit the frame could be coupled to fan housing unit 335 or include the same. Withdrawal of the objection to the drawings is respectfully requested.

B. The Office Action objects to the disclosure for informalities. Applicants respectfully submit the above amendments obviate the grounds for the objection. Withdrawal of the objection to the disclosure is respectfully requested.

C. The Office Action rejects claims 1-7 and 16-21 under 35 U.S.C. §112, second paragraph. With respect to guide protuberances, Applicants respectfully submit that the guide protuberance and/or the settle unit can be used to position a processor. With respect to a plurality of guides in the liquid cooling moving block, Applicants respectfully submit such a description is provided in at least paragraph 54 and Fig. 5 of the present specification. Withdrawal of the rejection of claims 1-7 and 14-21 under §112, second paragraph is respectfully requested.

D. The Office Action rejects claims 1-4, 6-7 and 21 under 35 U.S.C. §102(e) over U.S. Patent Publication 2002/0167799 to Kawashima et al. (hereafter "Kawashima"). The rejections are respectfully traversed.

With respect to claim 1, Applicants respectfully submit that Kawashima fails to disclose claimed features as required under §102. For example, Kawashima fails to disclose at least features of a cooling unit, wherein the cooling unit is a micro cooling unit configured to perform heat exchange, wherein the micro cooling unit includes a liquid coolant moving block configured to return coolant from a beginning of a liquid phase transition block from an end of the liquid phase transition block, and an insulation block between the liquid phase transition block and liquid coolant moving block and combinations thereof as recited. Further, Applicants respectfully submit that Kawashima does not teach or suggest any modification to its disclosure that would result in at least features of the micro cooling unit and combinations thereof as recited.

With respect to claim 21, Applicants respectfully submit that Kawashima discloses a single flat heat pipe 52 in a CPU cooler 24. Thus, Applicants respectfully submit that Kawashima does not teach or suggest a cooling system including a micro cooling system and a plate-type heat pipe and combinations thereof as recited in claim 21.

For at least the reasons set forth above, Applicants respectfully submit claims 1 and 21 define patentable subject matter. Claims 3 and 6-7 depend from claim 1 and therefore also define patentable subject matter for at least that reason as well as their additionally recited features. Claims 2 and 4 are canceled without prejudice or disclaimer. Withdrawal of the rejection of claims 1-4, 6-7 and 21 under §102 is respectfully requested.

E. The Office Action rejects claims 8-14 under 35 U.S.C. §103(a) over Kawashima and U.S. Patent Publication 2003/0016500 to Malone et al. (hereafter "Malone"). The Office Action rejects claim 15 under §103(a) over Kawashima, Malone and U.S. Patent No. 6,400,565 to Shabbir et al. (hereafter "Shabbir"). The rejections are respectfully traversed.

With respect to claim 8, Applicants respectfully submit that Kawashima and Malone, individually or in combination, do not result in at least features of a cooling system for use in a portable computer that includes a micro cooling system configured to perform heat exchange by repeating a cooling cycle of condensation and evaporation, wherein internally the micro cooling system includes a liquid coolant storage block, an evaporation block, a gaseous coolant moving block, and a condensation block, and combinations thereof as recited in claim 8. Further, Applicants respectfully submit that Kawashima, Malone or Shabbir, individually or in combination, do not teach or suggest any modification to their disclosure that would result in such features and combinations thereof.

With respect to claim 11, Applicants respectfully submit that Kawashima does not teach or suggest using identical material for forming the micro cooling system and the processor. See paragraphs 17, 50 and 53 of Kawashima and paragraph 40 of the present specification.

With respect to claim 15, Applicants respectfully submit that Kawashima, Malone and Shabbir do not teach or suggest the micro cooling unit that has a plurality of guides in a internal liquid cooling moving block. See heat pipes 46 that are coupled to heat dissipating body 48 in Fig. 2 of Shabbir.

For at least the reasons set forth above, Applicants respectfully submit claim 8 defines patentable subject matter. Claims 9-15 depend from claim 8 and therefore also define patentable subject matter for at least that reason as well as their additionally recited features. Withdrawal of the rejection of claims 8-15 under §103 is respectfully requested.

F. The Office Action rejects claims 16 and 18-20 under 35 U.S.C. §103(a) over Kawashima and U.S. Patent No. 6,351,382 to Nakanishi et al. (hereafter "Nakanishi"). The Office Action further rejects claim 17 under §103(a) over Kawashima, Nakanishi and U.S. Patent No. 6,166,908 to Samaras et al. (hereafter "Samaras"). The Office Action further rejects claim 5 under §103(a) over Kawashima. The rejections are respectfully traversed.

Applicants respectfully submit that Kawashima, Nakanishi and Samaras, individually or in combination, would not result in at least features of a cooling system for a portable computer including a plate-heated pipe coupled to one side of the frame to form a top surface of the fan housing unit, wherein the plate-heat pipe is configured to contact a heat source to deliver heat to the dissipating unit by circulating a fluid through its inside and combinations thereof as recited in claim 16.

Applicants respectfully submit that Samaras does not teach or suggest heat pipe lids 150, 400, 502, 602 forming a top portion of a fan housing unit and combinations thereof as recited. See Fig. 1, 4A-4C, 5A, 6A and 7; column 3, line 66-column 4, line 14; column 9, line 40-column 10, line 50 of Samaras. Applicants respectfully submit that Kawashima does not teach or suggest recited features of a heat pipe and combinations thereof. See Figs. 2-5 of Kawashima.

With respect to claim 5, Applicants respectfully submit that Kawashima, Nakanishi, Shabbir and Samaras do not teach or suggest at least features wherein the cooling unit is plate-shaped and approximately 1 mm thick. In contrast, flat heat pipe 52 in Kawashima vaporizes and condenses a liquid. Further, as described in paragraphs 62 and 64 of the present specification, a plate heat-pipe about 1 mm in thickness can deliver about 10 times more heat than the dissipating plate of the same shape made of copper of the conventional art. Thus, Applicants respectfully submit that the recited feature has a specific benefit not disclosed in the applied art.

For at least the reasons set forth above, Applicants respectfully submit claim 16 defines patentable subject matter. Claims 17-20 depend from claim 16 and therefore also define patentable subject matter for at least that reason as well as their additionally recited features. Withdrawal of the rejection of claims 5 and 16-20 under §103 is respectfully requested.

G. Claims 22-24 are newly added by this Amendment and believed to be in condition for allowance.

With respect to claim 22, Applicants respectfully submit that the applied references do not teach or suggest at least features wherein the micro cooling unit has first and second layers having different characteristics.

With respect to claim 24, Applicants respectfully submit that the applied references do not teach or suggest at least features wherein at least a portion of the micro cooling system and the processor are integrally formed and combinations thereof as recited.

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CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **Carl R. Wesolowski**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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